



SEA GRANT CONTRIBUTIONS TO THE NATION IN

COASTAL NATURAL HAZARDS

REDUCING THE LOSS OF LIFE AND PROPERTY

The goal of the Sea Grant Coastal Natural Hazards Initiative is to enhance preparedness and reduce losses of human life, property and environmental resources from coastal natural hazards in the United States. Sea Grant is united in this objective with many public and private interests, including NOAA's National Ocean Service and National Weather Service, Federal Emergency Management Agency (FEMA), U.S. Geological Survey, Institute for Business and Home Safety and U.S. Army Corps of Engineers. Sea Grant's strong connections with its universities and coastal constituencies, and its capabilities in the areas of basic and applied multidisciplinary research, education and technology transfer, enable it to contribute critical information and assistance to the national effort.

Sea Grant Produces National Benefits

Recent investment in Sea Grant coastal natural hazards programming has resulted in the following outcomes:

- Sea Grant raised awareness that insufficient construction setback regulations and associated construction too near retreating shorelines in Maui County, Hawaii, exacerbated beach loss and increased risks to life and property. Results of this work included the development of new, more effective erosion rate-based construction setback rules currently under adoption by Maui County, which will reduce beach loss and risks to life and property.
- Sea Grant has worked with coastal property owners – individuals, local governments and businesses – as Great Lakes water levels have fluctuated. During the mid-1980s, when levels were high, Sea Grant-developed computer models helped landowners determine the best options for mitigating damages from high levels.
- In 2002, when lake levels were at near-record lows, Sea Grant extension worked with the Michigan Boating Industries Association to educate the state legislature about the need for emergency legislation. As a result, the state provided a \$14 million emergency fund for state and municipal launches as well as \$20 million in long-term, low interest loans to help marinas provide access to affected facilities.
- Sea Grant supported life-saving research into techniques for treating cold water near-drowning hypothermia, and was nationally recognized for work in dive safety issues, training hundreds of emergency medical personnel and dive rescue workers and the production of internationally used training materials.
- Sea Grant recently published a report, *Impacts of Barrier Island Breaches on Selected Biological Resources of Great South Bay, New York*, on the state of the science in predicting ecosystem responses to barrier breaches along Long Island's extremely valuable South Shore. This has led to speedier decisions on how to deal with the intermittent breaches. For example, closing a breach at Westhampton Beach cost \$6.5 million more than it would have if there had been no delay in making the decision to close it.
- Since Hurricane Hugo struck South Carolina in 1989, Sea Grant has worked with Clemson University wind engineers to develop low-cost methods and materials to reduce the loss of lives and property associated with coastal storms. This research has allowed the scientific community to advise building code organizations on code improvements for high hazard areas, and provided guidance to coastal homeowners on effective methods and materials for strengthening roofs and shuttering windows. In one instance, the developer of Sun City, a 15,000-home coastal retirement community, changed the windows specified for all the new homes and fortified their installation based on these recommendations.
- Sea Grant, in partnership with local, state and federal governments and the private sector, retrofitted a Charleston house to demonstrate to homeowners a variety of options for window and roof protection options as well as ways to protect against flood and earthquake. 113 Calhoun Street: A Center for Sustainable Living in downtown Charleston (visit www.113calhoun.org for a virtual tour) received the national Association of State Flood Plain Managers "Excellence in Floodproofing" award and has been featured on the CBS Morning News and on the Bob Villa "Home Again" program.
- Sea Grant and the NOAA National Severe Storms Laboratory are leading a regional, multi-institutional cooperative project to create a cutting-edge flash flood prediction system that couples atmospheric, terrestrial and oceanic processes important to flash flood prediction over coastal areas. Using Doppler radar, a new NSSL rainfall estimation algorithm, GIS, digital mapping and an advanced hydrology model from the private sector, the project is producing real-time estimates of flooding for key geographic locations along



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the Tar River Basin test area in North Carolina.

- The U.S. Department of Defense, along with port and harbor authorities and worldwide engineering firms, is now using a wave model, CG-WAVE, as a standard tool for planning operations in coastal embayments and for designing harbor layouts and facilities. The model was designed by a Sea Grant-supported civil engineer at the University of Maine.
- Sea Grant research results in disaster mitigation are being used to evaluate permits both for retrofitting existing coastal structures and for new construction in the coastal zone. Findings also help local communities in Florida develop risk-based policies for funding the costs of hurricane emergency management services.
- Micro-propagation techniques developed by Sea Grant scientists, working alongside innovative coastal plant nurseries, now allow the production of genetically superior sea oats being used to restore Florida's coastal dunes on a state-wide basis. The principal industry partner, and one user of the technology, EcoGroup International Corporation (formerly Bundy Nurseries), Parrish, Florida, was recognized in Florida Trend Magazine (January 2003) as the largest producer of sea oats worldwide.
- Sea Grant is engaged as a partner in the Southeast Coastal Ocean Observing System (SEA-COOS) project in identifying stakeholders, providing information on the various projects and presenting results of the studies that will take place over the next months and years. This integrated effort, in cooperation with four Sea Grant programs and a host of universities and agencies, is the southeastern U.S. component of the national coastal ocean observing system.
- Sea Grant-pioneered research and extension initiatives in coastal hazard mitigation planning for municipalities, including initiation of a major partnership with the U.S. insurance industry, developed and promulgated incentives to reduce storm-induced property losses. As a result, Rhode Island was designated a "showcase state" by the Institute for Business and Home Safety for other communities across the nation to emulate. Finally, Sea Grant spurred the development of the town of Narragansett's hazard mitigation plan, which subsequently became a major case study in a FEMA training program.

- A Sea Grant-supported coastal engineering team in Delaware developed the SHORECIRC quasi-3D nearshore circulation model now being implemented by the U.S. Army Corps of Engineers' Waterways Experiment Station. This computer model is used by coastal engineers and resource managers to predict shorelines as well as the performance of coastal protection methods that may range from jetties to beach nourishment.

Building the Future on Successes of the Past

Sea Grant will join with federal and state agencies, coastal communities and the private sector to accurately assess the threats to the coast from natural hazards, generate and modify technologies to minimize damage, and develop education and public awareness initiatives to transfer research information from the nation's universities to all those who live, work and play along the nation's coastlines. Through a proactive partnership effort, property damage and loss of life can be reduced, saving the federal and state governments, taxpayers, business and industry, and the insurance community billions of dollars annually.